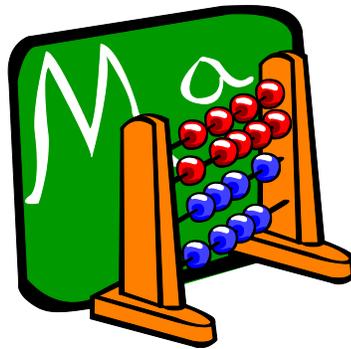


THIRD GRADE

Number and Number Sense



Place Value Hula Hoop Race

Reporting Category	Number and Number Sense
Topic	Identify place value for a six-digit numeral
Primary SOL	3.1 The student will a) read and write six-digit numerals and identify the place value for each digit.

Materials

- Number cards (15 to 20 cards written numerically and 15 to 20 cards written with word names)
- Two Hula Hoops

Vocabulary

ones, tens, hundreds, thousands, ten thousands, hundred thousands, place value, whole number, digits, period

Student/Teacher Actions (what students and teachers should be doing to facilitate learning)

1. Place Hula Hoops on the floor on one side of the room.
2. Spread half of the numeric cards and their corresponding word name cards in one hoop. Place second set in the other hoop.
3. Divide students into two teams lined up at the opposite end of the classroom from the Hula Hoops.
4. On your signal, the first student in each line races down to the Hula Hoops and finds a set of matching cards (one number card and its corresponding word name card). The students race back with the cards and place them on the floor near their line.
5. Quickly check to see if the card set is correctly matched. If it is, allow the next student in line to go. If it's not correct, quickly place the card set back in the Hula Hoop, as you signal the next student in that line to go.
6. Play continues until one team's Hula Hoop is empty, and the team has successfully matched all of its numeric cards with the corresponding word name cards.

Sample Number Cards

135	One hundred thirty-five
204	Two hundred four
35	Thirty-five
44,651	Forty-four thousand, six hundred fifty-one
12,044	Twelve thousand, forty-four
990	Nine hundred ninety
635,002	Six hundred thirty-five thousand, two
18,405	Eighteen thousand, four hundred five
62,091	Sixty-two thousand, ninety-one
18	Eighteen

Place Value Paths

Reporting Category	Number and Number Sense
Topic	Identify place value for a six-digit numeral
Primary SOL	3.1 The student will a) read and write six-digit numerals and identify the place value for each digit.
Related SOL	4.1

Materials

- Hundreds board
- Two sets of digit cards

Vocabulary

more than, less than, add, sum, subtract, difference, ones, tens, digits, double, multiple of

Student/Teacher Actions (what students and teachers should be doing to facilitate learning)

1. Mix the two sets of digit cards together and stack them facedown.
2. Draw two cards and announce the digits to the class. Ask, “What numbers can be formed using these digits?” (*Example: 5 and 6 are drawn, thus the number choices are 56 and 65.*)
3. Each player selects one of the digits. Remind students that their place value paths ultimately must contain six two-digit numbers, ordered from smallest to greatest. The six two-digit numbers need to touch. After six numbers, continue drawing numbers to reach both ends of chart.
4. Instruct students to independently record their number choices in one of the cells along the place value path. If students cannot place either of the possible numbers in any of their remaining cells, nothing is recorded.
5. After six draws, ask whether any students have completed their entire place value path. Draws continue until the majority of students have completed paths. Ask the students to compare their results.

Assessment

- **Questions:**
 - How did you decide where to place your numbers?
 - How do your paths differ from others in class?

Variations:

- Use three cards per draw.
- Use a two hundreds board.

Hundreds Board

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Digit Cards (copy and cut apart)

0	1	2	3	4
5	6	7	8	9

0	1	2	3	4
5	6	7	8	9

0	1	2	3	4
5	6	7	8	9

0	1	2	3	4
5	6	7	8	9

0	1	2	3	4
5	6	7	8	9

0	1	2	3	4
5	6	7	8	9

Place Value Roll

Reporting Category	Number and Number Sense and Computation and Estimation
Topic	Identify place value for a six-digit numeral Estimate and solve single-step and multistep problems
Primary SOL	3.1 The student will a) read and write six-digit numerals and identify the place value for each digit. 3.4 The student will estimate solutions to and solve single-step and multistep problems involving the sum or difference of two whole numbers, each 9,999 or less, with or without regrouping.

Materials

- Place value roll chart (Hundreds board, 99 board or 200 Hundreds board)
- Number cubes
- Cover disks (Bingo Chip, etc.)

Vocabulary

ones, tens, place value, digit, whole number, period, adding, subtracting, sum, difference

Student/Teacher Actions (what students and teachers should be doing to facilitate learning)

1. Instruct the starting player to roll the number cubes and add the numbers on the top faces. Students should then cover that number on the chart. (*Example: If one cube is 3, and the other cube is 4, students would then cover the number 7.*)
2. The next player rolls the number cubes, and the process repeats.
3. On the starting player's second turn, he or she rolls the number cubes and adds the total to the sum rolled on the first turn. (To score totals greater than 10, the player can use two number cubes.)
4. Have players alternate turns until one player reaches 99 or higher.

Assessment

- **Questions**
 - What methods did you use to add? (*add on, double, estimate, paper and pencil*)
 - How could you check your answers? (*paper and pencil, calculator, subtraction*)

Variations:

- Give each pair a calculator to check answers in the beginning. Or, assign a third student to check answers.
- Start at 99, and subtract the roll value of the number cubes instead of adding. The first player to reach zero wins.
- Use a six- or 12-sided number generator.
- Use three number cubes on a 200s chart.

Hundreds Board

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Hundreds Board 0-99

0	1	2	3	4	5	6	7	8	9
10	11	12	13	14	15	16	17	18	19
20	21	22	23	24	25	26	27	28	29
30	31	32	33	34	35	36	37	38	39
40	41	42	43	44	45	46	47	48	49
50	51	52	53	54	55	56	57	58	59
60	61	62	63	64	65	66	67	68	69
70	71	72	73	74	75	76	77	78	79
80	81	82	83	84	85	86	87	88	89
90	91	92	93	94	95	96	97	98	99

Two-hundreds Board

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100
101	102	103	104	105	106	107	108	109	110
111	112	113	114	115	116	117	118	119	120
121	122	123	124	125	126	127	128	129	130
131	132	133	134	135	136	137	138	139	140
141	142	143	144	145	146	147	148	149	150
151	152	153	154	155	156	157	158	159	160
161	162	163	164	165	166	167	168	169	170
171	172	173	174	175	176	177	178	179	180
181	182	183	184	185	186	187	188	189	190
191	192	193	194	195	196	197	198	199	200

Hundred Chart Activities

Reporting Category	Number and Number Sense and Computation and Estimation
Topic	Identify and write ordinal numbers
Primary SOL	3.1 The student will a) read and write six-digit numerals and identify the place value for each digit. 3.4 The student will estimate solutions to and solve single-step and multistep problems involving the sum or difference of two whole numbers, each 9,999 or less, with or without regrouping.
Related SOL	4.1a, 4.1c

Materials

- Hundred charts (1 to 100 board and 0 to 99 board)
- Counters for Hundred chart

Vocabulary

ones, tens, hundreds, thousands, ten thousands, hundred thousands, place value, rounding, digit, whole number, period, product, one more, ten more, one less, ten less, descending order

Student/Teacher Actions (what students and teachers should be doing to facilitate learning)

1. Give each student a Hundred chart and a counter.
2. Practice by having students put a counter (or a finger) on a number on the Hundred chart (34, for example). Tell them to add 10. Ask, “What is the sum?” (44) Make sure students understand that adding 10 to 34 requires moving down one space on the Hundred chart. *(Students usually will learn that they just need to move down one space when adding 10, instead of counting one by one.)*
3. Try another example (56). Ask students to add 10 (66). Again, students should move their counters down one space on the Hundred chart. Do as many examples as necessary until all students can successfully complete the task.
4. Next, have students place a counter on 72, and then subtract 10. Tell students to note that their counters move up one space because they are subtracting, not adding. Practice several subtraction examples.
5. Try adding 11. Tell students to place a counter on 24, and then add 11. Students should move finger down one space to make 10 and then one space to the right, indicating that 11 is the same as 10 + 1. Try more examples until students grasp the concept.
6. Move to a subtraction example. Ask students to put a counter on 89, and then subtract 11. Students should move up one space to represent minus 10, and then move one to the left to subtract 1, arriving at the answer of 78.
7. Students should now be ready to play the following games. As you play each game, you’ll see students getting faster at adding and subtracting once they understand how to manipulate (decompose numbers on) the Hundred chart.

Game One

1. Tell students that you're thinking of a number on the Hundred chart. Offer clues to help students identify the number.
2. Ask students to place their counters on the *sum* of 11 and 7. Have them check with a neighbor to make sure everyone is starting on the same number (18).
3. Add 20. (*Monitor students to check if they move their counters down two spaces to add 20, arriving at the sum of 38.*)
4. Subtract 2. Ask, "Where are you now? Are you on a multiple of 6?"
5. Subtract 10, and then subtract 1. Ask, "Is your number the same as the number of pennies in a quarter?" (*yes, 25*)
6. Add 9. (*You may notice students adding 10 and then subtracting 1.*)
7. Add 11. Ask, "Are you on a *multiple* of 5?" (*yes, 45*)
8. Subtract 2, and add 21. Ask, "Is the *sum* of the digits 10?" (*yes, 64*)
9. Add 31, and then subtract 10.
10. Add 1, and then subtract 20. Ask, "Are both *digits* the same?" (*yes*)
11. Ask students: "What's my number?" (66)

Game Two

1. Instruct students to place a counter on the *product* of 11 and 7. Have them check with a neighbor to make sure everyone is starting on the same number (77).
2. Add 20, and then subtract 2. Ask, "Are you on a *multiple* of 5?" (*yes, 95*)
3. Subtract 10, and then subtract 1. Ask, "Is the tens place *double* the ones place?" (*yes, 84*)
4. Add 9, and then subtract 30. Ask, "Is the number a *multiple* of 3?" (*yes, 63*)
5. Subtract 2, and then add 21. Ask, "Is the *sum* of the digits 10?" (*yes, 82*)
6. Subtract 31 and add 10.
7. Add 1 and then subtract 18. Ask, "Are both *digits* the same?" (*yes*)
8. Ask, "What's my number?" (44)

Game Three

1. Instruct students to place a counter on the *product* of 5 and 7. (Ask students to answer aloud, so that everyone starts on the same number, 35.)
2. Subtract 3. Add 11. Ask, “Are the digits in consecutive *descending order*?” (*yes, 43*)
3. Add 12, and then add 9.
4. Subtract 1. Ask, “Is the tens place double the ones place?” (*yes, 63*)
5. Subtract 9, and then add 1.
6. Add 20. Ask, “Is this the amount of change you would get from \$1, after making a 25-cent purchase?” (*yes, 75 cents*)
7. Subtract 3, and then add 9. Ask, “Is this number a *multiple* of 9?” (*yes, 81*)
8. Subtract 29. Ask, “Is the *sum* of the digits 7?” (*yes*)
9. Ask, “What’s my number?” (*52*)

Assessment

- **Questions**

- What happens to a number when you go up one space? (*increases by 10*)
- What happens to a number when you go down one space? (*decreases by 10*)
- How can you write 11? ($10 + 1$) How do you show that number on the Hundred chart? (*move up one and over one*)
- What other patterns did you notice when using the chart?

Variations:

- Use a Two Hundreds Board

Hundreds Board

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Hundreds Board 0-99

0	1	2	3	4	5	6	7	8	9
10	11	12	13	14	15	16	17	18	19
20	21	22	23	24	25	26	27	28	29
30	31	32	33	34	35	36	37	38	39
40	41	42	43	44	45	46	47	48	49
50	51	52	53	54	55	56	57	58	59
60	61	62	63	64	65	66	67	68	69
70	71	72	73	74	75	76	77	78	79
80	81	82	83	84	85	86	87	88	89
90	91	92	93	94	95	96	97	98	99

Build the Number

Reporting Category	Number and Number Sense
Topic	Identify place value for a six-digit numeral and round
Primary SOL	3.1 The student will <ol style="list-style-type: none">read and write six-digit numerals and identify the place value and value of each digit;round whole numbers, 9,999 or less, to the nearest ten, hundred, and thousand.

Materials

- Place-value mat
- Cards 0–9
- Overhead projector
- Overhead transparency with number word written on it
- White boards or paper for each student
- Wooden board with nails and beads to serve as abacus

Vocabulary

ones, tens, hundreds, thousands, ten thousands, hundred thousands, place value, rounding, digit, whole number, period

Student/Teacher Actions (what students and teachers should be doing to facilitate learning)

1. Introduce activity by reviewing place-value mat and the terms of each period (i.e., ones, tens, hundreds).
2. Write a number word (e.g., three hundred fifty-two) on the overhead transparency.
3. Students should use their cards to show the numerical value of the number word.
4. Circulate around the room, monitoring student answers.
5. After giving students several examples, increase number values to include numbers up to the hundred thousands place. For example, have students write “nine hundred forty-five thousand, sixty-one.”
6. You may substitute place-value mat and cards 0–9 with place value cards.

Assessment

- **Questions**
 - What happens when there is not a number written for the hundreds place? How do you write that? Give the example, “nine hundred forty-five thousand, sixty-one” (945,061). Remind students that they will put a zero in the hundreds place to represent no hundreds in this number.

Number Cards

0	1	2	3	4
5	6	7	8	9

Place Value Chart – Whole Numbers

Thousands	,	Hundreds	Tens	Ones

Rounding It

Reporting Category	Number and Number Sense and Computation and Estimation
Topic	Identify place value for a six-digit numeral and round
Primary SOL	3.1 The student will <ol style="list-style-type: none">read and write six-digit numerals and identify the place value for each digit;round whole numbers, 9,999 or less, to the nearest ten, hundred, and thousand.

Materials

- Spinner board and spinner (e.g., pencil or paper clip)
- Recording sheet for each student
- Base-10 blocks

Vocabulary

ones, tens, hundreds, thousands, ten thousands, hundred thousands, place value, rounding, whole number, digits, period

Student/Teacher Actions (what students and teachers should be doing to facilitate learning)

Practice instructions: Have students practice rounding numbers by building a given number with base-10 blocks and then rounding that number to the nearest ten, hundred, or thousand. Have students use the physical models (base-10 blocks or a number line) to explain the rounding process.

1. Instruct students to take turns spinning the spinner to create a two-, three-, or four-digit number, according to the instructions on the recording sheet.
2. Have students write each number on the recording sheet as they spin it. It will take two, three, or four spins to create the numbers.
3. After students complete the number, ask them to round it to the nearest ten, hundred, or thousand, following the recording sheet instructions.
4. Students should write the rounded number on the recording sheet.

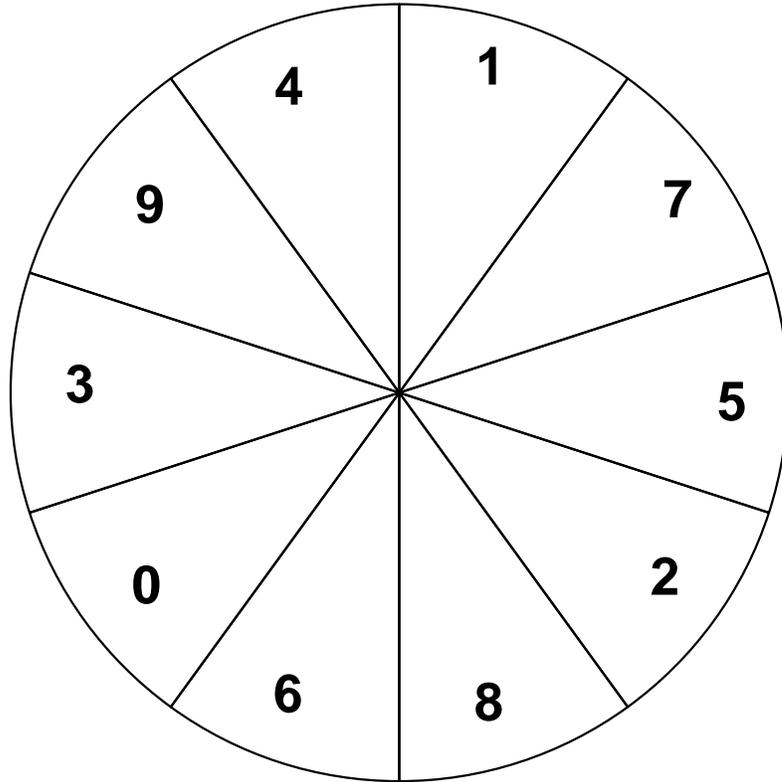
Assessment

- **Questions:**
 - What is the value of a digit in a particular place?
 - What happens when there isn't a number in a place? How do you write that number? Are you including the zero in the number?

Variations:

- Have students work with the number 2,549, exploring what happens when it's rounded to the nearest ten, hundred, and thousand. Students should compare their answers.

Spinner



Rounding It Recording Sheet

Name: _____

Number of Digits	Number Made	Round to the Nearest ____	Rounded Number
<i>Sample</i> 3	247	Ten	250
2		Ten	
2		Ten	
2		Ten	
3		Ten	
3		Hundred	
3		Hundred	
4		Thousand	
4		Hundred	
4		Hundred	
4		Thousand	

Yes or No, What's My Number?

Reporting Category	Number and Number Sense
Topic	Compare numbers using symbols and words
Primary SOL	3.1 The student will c) compare two whole numbers between 0 and 9,999, using symbols ($>$, $<$, or $=$) and words (<i>greater than</i> , <i>less than</i> , or <i>equal to</i>).
Related SOL	4.1, 5.1

Materials

- A sticker for each student with a number on it between 0 and 9,999

Vocabulary

greater than, less than or equal

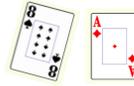
Student/Teacher Actions (what students and teachers should be doing to facilitate learning)

1. Put a number between 0 and 9,999 on the back of each student's shirt, using a sticker. Have students walk around the room and ask a classmate one question: "Is my number greater than, less than, or equal to number _____?" Students will need to continue walking around the room and asking other classmates the question (varying the number) until determining the number on the sticker. Students have the option of carrying a folder or clipboard with a piece of paper to write down their questions, and answers received. Check to see their notations.
2. When a student deduces his/her number, he/she can move the sticker to the front of his/her shirt. She/he can continue to answer questions for other students who have not figured out their numbers. Play continues until everyone knows their numbers.
3. Next, ask the students to line up around the room from least to greatest, based on their numbers.
4. At the end of the lesson, ask the students to explain their methods for eliminating choices and arriving at their numbers. Did they have a strategy?

Variations:

- Check to see what types of notations the students are using on their papers as they circulate. If they use words, ask if they can use symbols; if they use symbols, ask if they can put their notation in words.
- Evaluate the questions that they ask. Are they just guessing, or are they using some type of strategy to eliminate certain choices?
- Have the students share their ideas as a group.

If I Know...Then I Know...



Reporting Category	Number and Number Sense
Topic	Recognize and use inverse relationships to solve problems
Primary SOL	3.2 The student will recognize and use the inverse relationships between addition/subtraction and multiplication/division to complete basic fact sentences. The student will use these relationships to solve problems.
Related SOL	2.9, 3.5

Materials

- If I Know...Then I Know...recording sheet
- One deck of cards (number cards only, no face cards) per team

Vocabulary

inverse relationship

Student/Teacher Actions (what students and teachers should be doing to facilitate learning)

Students will reflect on the related facts they learned in second grade for addition and subtraction to develop the concept of addition and subtraction as inverse operations. We play the game If I Know...Then I Know...

1. Students will explore inverse relationships between addition and subtraction number sentences and between multiplication and division number sentences. Model a related fact, using the numbers 8, 6, and 14. Hold a discussion about what different addition and subtraction number sentences could be made using the given numbers. Have students discuss the possibilities with partners or in small groups, and then have a representative from each group share suggestions with the class.
2. Discuss how subtraction number sentences use the same three numbers as addition number sentences but are represented in an inverse fashion.
3. Repeat the process, using the numbers 4, 6, and 24, and have students discuss what different multiplication and division number sentences could be made. Discuss the inverse relationship between multiplication and division.
4. Have students practice creating related facts, showing the inverse relationship between facts. Distribute copies of the If I Know...Then I Know... recording sheet and decks of number cards.
5. Have students select two number cards from a deck and use the two number cards drawn to come up with a third number by adding or multiplying them. Then, have the students use the three numbers to create facts with their inverses (related facts) and record them on the recording sheet.

Variations:

- Have students repeat the activity by drawing dominoes from a bag or roll two number cubes to generate the first two of three numbers.
- Provide students with three numbers, and have them determine whether or not the numbers can be used to create addition/subtraction related facts or multiplication/division related facts. If they determine that the numbers can create related facts, have students write the related facts.
- Provide to students three numbers using subtraction or division and have them generate the related facts using the inverse operation.

If I Know...Then I Know...



Name: _____ Date: _____

Pull two number cards from a deck and record the two numbers drawn. Add (+) or multiply (×) the two numbers to come up with a third number, and record it. Complete the related fact using addition/subtraction or multiplication/division. Record the number sentences for each related fact on the lines provided.

1. _____

4 6 24



2. _____

3. _____

People Fractions

Reporting Category	Number and Number Sense
Topic	Name, write, and model fractions including mixed numbers
Primary SOL	3.3 The student will <ol style="list-style-type: none">name and write fractions (including mixed numbers) represented by a model;model fractions (including mixed numbers) and write the fractions' names.
Related SOL	2.3a, b, 3.16, 4.2a, b

Materials

- Read aloud a story about five creatures
- Two construction paper squares
- Scissors

Vocabulary

halves, thirds, fourths, fifths, sixths, eighths, tenths

Student/Teacher Actions (what students and teachers should be doing to facilitate learning)

1. Read a story about five creatures to the class. Relate the family in the story to fractions, using the five creatures in the house as a set model for a whole. Ask, “What fraction of the creatures in the house likes to eat mice?”
2. Ask for six volunteers to go to the front of the room to serve as a whole group. Ask the students to find fractions that politely describe parts of the whole group (e.g., two-sixths of the students are wearing tennis shoes). When appropriate, show reduced fractions by having students group themselves accordingly. For example, if two-sixths of the students have tennis shoes, ask students to arrange their groupings to demonstrate that one-third of the students are wearing tennis shoes (e.g., have all the students pair up to show three groups within the whole). Repeat this activity, allowing students to model and identify other fractions within the group.
3. Show the class two squares. Ask the students to describe the squares, making sure that they recognize that the squares are congruent. Cut one square in half vertically and the other square in half on the diagonal. Tell students to imagine the squares are granola bars. Ask, “Which piece would you like to have?” Discuss students’ answers.

Greater Than, Less Than, or Equal To?

Reporting Category	Number and Number Sense
Topic	Compare fractions using words and symbols
Primary SOL	3.3 The student will c) compare fractions having like and unlike denominators, using words and symbols (>, <, or =).
Related SOL	3.3a, b

Materials

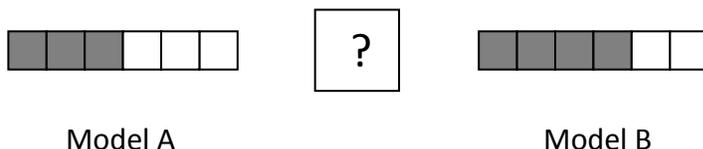
- Fraction models with like and unlike denominators

Vocabulary

numerator, like denominator, unlike denominator, greater than, less than, equal to

Student/Teacher Actions (what students and teachers should be doing to facilitate learning)

1. Students will name two fractions from the models presented with like denominators.
2. They will compare the size of the fraction models to determine if Model A is greater than, less than, or equal to Model B:



3. Have students justify their responses. It is important that they recognize that each model represents one whole with 6 equal parts (boxes). Students should recognize that Model A has 3 of the 6 equal parts shaded and Model B has 4 of the 6 equal parts shaded. Students will consider that 3 shaded equal parts is less than 4 shaded equal parts, therefore, Model A is less than Model B.
4. Have students identify the fraction name for the two models and record using symbols:

$$\frac{3}{6} < \frac{4}{6}$$

5. Continue comparing fractions with like and unlike denominators to include models that are less than, greater than, and equal to.